QTEN · QUEENSLAND TECHNICAL EXCELLENCE NETWORK

KNOWLEDGE HANDBOOK · VOLUME 02

Soil & Land

Soil condition, land degradation, contaminated land and acid sulfate soils.

How to use this handbook

This volume is the practitioner (site and technical) reference for the Soil & Land factor. It sets out what Soil & Land governs, every assessment element with its own process and controls, the Queensland and Commonwealth instruments that apply, and the primary metric for each element. It is decision support, not legal advice or a substitute for a site-specific assessment — confirm every regulatory point against the current instrument and, where a threshold is close or a critical exception applies, obtain specialist and legal review.

FIELD	DETAIL
Volume	02 of 17 — Environmental Knowledge Handbooks
Factor	Soil & Land
Jurisdiction	Queensland, Australia
Edition	2026 · current at issue
Prepared by	QTEN — Queensland Technical Excellence Network
Review	SME, spatial and legal review before reliance

Executive overview

Soil and land underpin every project's foundations, drainage and liability profile, yet the risk is usually invisible until it is expensive. In Queensland the acute exposures are contaminated land — the Environmental Management Register and Contaminated Land Register under Chapter 7 of the Environmental Protection Act 1994 — and acid sulfate soils, managed through the State Planning Policy and state guidelines. Around these sit soil health, erosion and land degradation, which drive sediment loss, stability and rehabilitation cost. The site-manager task is to know the land's history and listing status early, assess before disturbance, and manage disturbed soil and acid sulfate material to defensible standards.

Scope

Soil & Land resolves into four secondary factors — Soil Condition and Function; Land Degradation; Contaminated Land; Landform and Land Management — and twenty assessment elements. Every element is set out below with its own process and controls and its primary decision metric; identifiers are shared with the companion Knowledge System workbook and the platform calculators.

Assessment elements & process

Each assessment element below carries what it governs and its key pressures, the appropriate site process and controls, and the primary metric that measures it. Work every element that your project engages.

ASSESSMENT ELEMENT	WHAT IT GOVERNS & KEY PRESSURES	PROCESS & CONTROLS
Soil Health *Soil health index*	Overall capacity of soil to function for the land use and rehabilitation. Pressures: compaction, erosion, contamination, organic-matter loss.	Baseline soil health; set rehabilitation targets; manage topsoil, structure and amendment; monitor recovery against the index.
Soil Physical Properties *Physical condition compliance*	Physical structure, texture and stability of soil. Pressures: compaction, structural decline, poor handling.	Characterise physical properties; manage traffic and stripping; decompact and amend; verify against condition targets.

ASSESSMENT ELEMENT	WHAT IT GOVERNS & KEY PRESSURES	PROCESS & CONTROLS
Soil Chemical Properties *Chemical condition compliance*	Chemical status — pH, nutrients, salinity, contaminants. Pressures: acidification, salinity, contamination, nutrient loss.	Test chemistry; compare to land-use criteria; amend or manage; re-test to confirm compliance.
Soil Biology and Biodiversity *Soil biological condition score*	Soil biological function and biodiversity. Pressures: disturbance, compaction, loss of organic matter, contamination.	Protect and reinstate topsoil and organic matter; minimise disturbance; monitor biological condition in rehabilitation.
Soil Organic Carbon and Fertility *Soil organic carbon stock*	Soil organic carbon stock and fertility. Pressures: clearing, cultivation, erosion, topsoil loss.	Baseline carbon and fertility; conserve and stockpile topsoil; amend; monitor stock through rehabilitation.
Soil Erosion *Estimated annual soil loss*	Detachment and transport of soil by water or wind. Pressures: clearing, earthworks, concentrated flow, erodible soils.	Estimate soil loss; stage disturbance; install drainage, diversion, basins and stabilisation; progressively rehabilitate.
Sedimentation *Sediment export load*	Off-site movement and deposition of eroded sediment. Pressures: exposed areas, rainfall, inadequate controls.	Model sediment export; size sediment controls to the standard; inspect after rain; correct failing controls.
Soil Compaction *Area exceeding compaction threshold*	Compaction reducing soil function and infiltration. Pressures: trafficking, stockpiling, heavy plant.	Limit trafficking and confine access; protect stockpiles; decompact before rehabilitation; verify against the threshold.
Salinity *Salinity affected area*	Salinity affecting soil, water and vegetation. Pressures: rising water tables, altered drainage, irrigation.	Assess salinity risk and extent; manage water tables and drainage; select tolerant rehabilitation; monitor affected area.
Sodicity and Dispersion *Dispersive soil risk score*	Dispersive and sodic soils prone to erosion and instability. Pressures: exposure, wetting, poor handling.	Identify dispersive soils; apply gypsum and cover; avoid exposure and concentrated flow; verify treatment.
Soil Acidification *Area below target pH*	Acidification lowering soil pH below target. Pressures: oxidation, fertiliser, leaching.	Test pH; apply liming to target; manage sources; re-test to confirm the area below target is corrected.
Acid Sulfate Soils *Net acidity and treatment requirement*	Acid sulfate soils that generate acidity when disturbed. Pressures: excavation, dewatering, exposure of PASS/AASS.	Check ASS mapping; sample and calculate net acidity; prepare an ASS management plan; neutralise (liming) or contain; verify before disposal.
Land Contamination *Contamination linkage risk score*	Land affected by contaminants presenting a risk or listing. Pressures: historical use, spills, fill, legacy activity.	Review history and EMR/CLR; investigate against NEPM criteria for the use; notify if triggered; remediate or validate.
PFAS Contamination *PFAS source-pathway-receptor risk*	PFAS presence and source-pathway-receptor risk. Pressures: legacy AFFF, biosolids, imported fill.	Screen for PFAS sources; sample to the PFAS NEMP; assess pathways and receptors; contain and manage; notify if confirmed.
Hydrocarbon and Metals Contamination *Exceedance and contaminant mass*	Hydrocarbon and metal contamination and mass. Pressures: fuel and oil, industrial residues, imported fill.	Delineate extent and mass; compare to screening levels; remediate or manage; validate to the land-use criteria.
Contaminated Land Investigation and Remediation *Investigation decision confidence*	Investigation and remediation decision-making. Pressures: uncertainty, inadequate data, incomplete delineation.	Scope a defensible Phase 1/2; design sampling for decision confidence; select and validate remediation; document the decision basis.
Land Capability and Suitability *Suitable land proportion*	Capability and suitability of land for the intended use. Pressures: slope, soil constraints, hazard, SCL/agricultural value.	Assess land capability and constraints; avoid unsuitable and high-value land; design to the capability class.
Land Disturbance and Earthworks *Open disturbed area*	Extent and duration of land disturbance and earthworks. Pressures: large open areas, prolonged exposure, poor sequencing.	Minimise and stage the open disturbed area; stabilise progressively; sequence earthworks to limit exposure.

ASSESSMENT ELEMENT	WHAT IT GOVERNS & KEY PRESSURES	PROCESS & CONTROLS
Topsoil Management *Topsoil recovery and reuse rate*	Stripping, stockpiling and reuse of topsoil. Pressures: mixing, erosion of stockpiles, loss of viability.	Strip and segregate topsoil; protect and vegetate stockpiles; reuse in rehabilitation; track recovery and reuse rate.
Land Rehabilitation and Closure *Rehabilitation completion and trajectory*	Rehabilitation and closure to a stable, agreed end state. Pressures: unstable landforms, poor establishment, incomplete closure.	Set rehabilitation criteria and landform design; establish cover; monitor trajectory against reference; close against criteria.

Regulatory mapping

The instruments most often engaged for Soil & Land. Confirm currency and application to the specific site and activity before relying on any entry.

INSTRUMENT	JURIS.	WHAT IT DOES	TYPICAL TRIGGER
Environmental Protection Act 1994 (Ch 7)	Qld	Contaminated land — EMR/CLR, notifiable activities, duty to notify, site management.	A notifiable activity, or contamination that may cause harm.
Environmental Protection Regulation 2019	Qld	Standard conditions; contaminated-land and ERA administration.	Carrying out a relevant prescribed activity.
NEPM (Assessment of Site Contamination) 2013	Cth	Assessment framework and screening levels for site contamination.	Assessing land for a sensitive or commercial use.
State Planning Policy	Qld	Acid sulfate soils and agricultural-land outcomes in development assessment.	Disturbing ASS-mapped land or SCL.
Planning Act 2016	Qld	Development assessment triggers for contaminated and constrained land.	Assessable development on affected land.
Soil Conservation Act 1986	Qld	Soil conservation and erosion management on rural land.	Works causing soil erosion on rural land.

Assurance & evidence

- **Source currency.** Confirm the instruments, criteria and trigger values cited are current and correctly applied to the site and activity.
- **Records.** For each element engaged, retain the assessment, the controls applied, monitoring against the metric, and any statutory notifications — the evidence that the process was followed.
- **Independent review.** Interpretations, threshold decisions and critical exceptions are reviewed by a suitably qualified person before reliance.